

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

Applicant's or agent's file reference 02R00363/PC	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/JP 03/10421	International filing date (day/month/year) 18.08.2003	Priority date (day/month/year) 23.08.2002
International Patent Classification (IPC) or both national classification and IPC H01L21/203		
Applicant SHARP KABUSHIKI KAISHA et al.		



- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 25.03.2004	Date of completion of this report 22.10.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Wolff, G Telephone No. +49 89 2399-2578 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/JP 03/10421**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-29 as originally filed

Claims, Numbers

1-21 as originally filed

Drawings, Sheets

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-17
	No: Claims	18-21
Inventive step (IS)	Yes: Claims	
	No: Claims	1-21
Industrial applicability (IA)	Yes: Claims	1-21
	No: Claims	

2. Citations and explanations
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/JP 03/10421

SECTION V:

0 This IPER is based on the following documents cited in the search report:

D1: WO-A-02/103090 (published 27 December 2002)

D2: WO-A-02/01608

D3: EP-A-1061564

D4: EP-A-1164210

1 The subject-matter of device claims 18-21 is defined by method steps. Thereby the category of the claims is not clear (Article 6 PCT).

2 From D2, see in particular page 14, lines 9-14 together with claims 1-17, 60-61 and 65, a method of growing an AlGa_N semiconductor layer structure is known, comprising the step of:

(a) supplying ammonia, gallium and aluminium to a growth chamber thereby to grow a first (Al,Ga)_N layer having a non-zero aluminium mole fraction by MBE over a substrate disposed in the growth chamber.

Thus, the subject-matter of claim 1 differs from the state of the art only in that ammonia is supplied at a beam equivalent pressure of at least 1×10^{-4} hPa, gallium is supplied at a beam equivalent pressure of at least 1×10^{-8} hPa and aluminium is supplied at a beam equivalent pressure of at least 1×10^{-8} hPa.

However, it is a routine measure of the skilled person to determine optimum deposition parameters.

Consequently, the subject-matter of claim 1 is obvious for the person skilled in the art. Claim 1 does therefore not meet the requirement of Article 33(3) PCT.

3 Similarly, the subject-matter of claim 1 is also obvious in view of D3 (see in particular the claims and figures 1 and 6) and/or D4 (see in particular paragraphs [0040], [0044] and [0057] and the claims).

4 The subject-matter of dependent claims 2-17 is also known or obvious in view of D2, D3 and/or D4.

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- 5 Disregarding the method features in claims 18-21 (see above), the subject-matter of these claims is known in the prior art, see D1-D4.